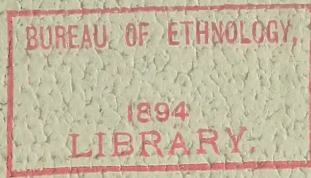


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REVIEW EXTRAORDINARY
OF
“Man and the Glacial Period”

BY A MEMBER OF
THE UNITED STATES GEOLOGICAL SURVEY,
WITH ANNOTATIONS AND
REMARKS THEREON

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Judge C. C. BALDWIN, LL. D.

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PROFESSOR GEORGE FREDERICK WRIGHT, D.D., LL.D., was born in Whitehall, N. Y., January 22, 1838. He graduated in the classical course of Oberlin College in 1859 and from the Theological Seminary in 1862. From 1862 to 1871 he was pastor of a Congregational Church in Bakersfield, Vermont. He there commenced to give attention to the study of local geology, getting suggestions from Professor C. H. Hitchcock and writing on the glacial phenomena for the papers.

In 1871 he became pastor at Andover, Mass., where he pursued a more systematic study of glacial phenomena, making the happy acquaintance of Professor Asa Gray, of Harvard, and Professor Alpheus Hyatt, of the Boston Society of Natural History, pursuing a very active intellectual career, and as early as 1876 his extended observations were reported at length in the proceedings of the Boston Society of Natural History. While thus engaged, Mr. Clarence King gave him information of the terminal moraine south of New England. From that time on, the subject was never out of his mind, and his summer months, with much other spare time, were devoted to it.

He spent four seasons in New England, and, in company with Professor H. Carvill Lewis, followed the line already surveyed by Professors Cook and Smock through New Jersey.

These two were then invited by Professor Lesley to survey the boundary line in Pennsylvania. Their report is Volume Z of the 2d Penn. Geological Survey.

In 1881 he became professor in the Oberlin Theological Seminary. Shortly after, the *Bibliotheca Sacra* was moved from Andover to Oberlin, to be placed under his editorship, and he has been one of its editors ever since.

His duties as professor have, since that time, given him several months each year; all devoted to glacial studies.

In 1882-83 he followed the limits of the great ice sheet through Ohio, Kentucky and Indiana. The results partly appeared in the *American Journal of Science* for July, 1883, and a full report with maps in Tract 60 of the Western Reserve Historical Society. The line was continuously traced and in the above report maps are given for the States and for every county in Ohio. The report was reprinted verbatim by the State of Pennsylvania.

In 1884 he was employed by the United States Geological Survey to trace the line to the Mississippi River and to review the field in Ohio and Pennsylvania.

The condensed report of his work was issued in 1890, and contained the result of observations made to that year. (Bull. 58, U. S. Geol. Survey.)

In 1886 he visited Alaska and camped for a month by the Muir Glacier. In the season of 1887-88 he further explored Ohio, Dakota and other parts of the Northwest. In the fall of 1887 he delivered a course of lectures on his hobby before the Lowell Institute in Boston and in 1888 before the Peabody Institute of Baltimore and in Brooklyn. In 1889 he published his great work "The Ice Age in North America"* (648 pp. 8 vo.), which has met a large sale in this country and abroad and has made him famous.

The summer of 1890 was spent in study of the lava beds of the Pacific coast.

In the summer of 1891 he visited Europe to there study the Ice Age and Early Man, for the first of which his unprecedented study of the ice limits in the United States gave him great advantage, and he was warmly received by scientists abroad.

In the winter of 1891-92 he gave a second course of Lowell lectures and in 1892 there was issued his latest book, in the International Scientific Series, entitled "Man and the Glacial Period" (384 pp. 12 mo. 108 illustrations and 3 maps).

Professor Wright has also been a generous contributor, mainly upon his favorite topic, to the publications of the Boston Society of Natural History, the *American Naturalist*, the *New Englander*, *American Journal of Science*, the *American Geologist*, the *Nation*, the *Independent*, the *Advance*, the *Congregationalist*, the *Atlantic Monthly*, *Scribner's Magazine* and other papers, and has delivered many lectures. He has also published in 1881 the "Logic of Christian Evidences;" in 1882, "Studies in Science and Religion," and in 1884, "The Divine Authority of the Bible." He has a thoughtful, active, discriminating mind, careful in investigation and not fast to conclusion. He is modest and candid and has done an amount of active intellectual work that few could do unless their studies had been as largely in the field.

At present he fills the chair at Oberlin, of Professor of "Relations of Science and Religion," with leave of absence for several months each year to pursue his investigations. This professorship was created for him.

This notice is in the main condensed from the *Popular Science Monthly* for December, 1892.

*The Ice Age in North America and its Bearings upon the Antiquity of Man, by G. Frederick Wright, D. D., LL.D., F. G. S. A., Professor in the Oberlin Theological Seminary; Assistant upon the United States Geological Survey; Author of "Logic of Christian Evidences," etc., with an appendix on "The Probable Cause of Glaciation," by Warren Upham, F. G. S. A., Assistant upon the Geological Survey of New Hampshire, Minnesota and the United States. D. Appleton & Co., New York, 1889

REVIEW EXTRAORDINARY.

The following article is reprinted verbatim from the *American Anthropologist* for January, 1893.

The language is so extraordinary for the discussion or review of matters of science that occasional words are put in capitals which in the original are in ordinary type.

The letters in heavy black type refer to notes occasionally added to correct mistakes, where tangible and definite charges are made.

MAN AND THE GLACIAL PERIOD.

BY W J MCGEE.

I.

Wheresoever workers assemble, there IDLERS (A) gather to feast on the fruits of honest toil ; a part are PITIABLE PAUPERS, some traffic in UNWHOLESOME WARES, others SWINDLE THE UNWARY under the cloak of honest dealing and CHEAT JUSTICE by specious pleas, and still others STEAL AND ROB. Thus the laborer is always the prey of the idler, and progressive mankind is handicapped by the burden of the helpless and the perverse.

In like manner the workshops and market-places of science are haunted by HARPIES ; a part are the feeble of mind who always absorb but never produce, some STARVE AND POISON hungry minds with the husks of FICTION and the lotus of myth, others FOIST FALSEHOOD on the unwary under the guise of science and HIDE FROM JUSTICE behind shields of skillfully-woven words, and still others scoff at reason and rob knowledge of its glory. Thus creative genius is the prey of intellectual PARASITES, and the progress of knowledge is hindered by the helplessness and the perverse.

Anthropology is the youngest of the sciences, and even yet is barely crystallized out of the original magma of unsystemic (B) thought; more-

(Note A) Observe the natural flow of language and easy grace of the reviewer in this style of writing.

(Note B) One of Mr. McGee's words, not yet in the Century Dictionary.

over, anthropology is the most complex and obscure among the subject of knowledge, so that its field gives but treacherous ground even for the cautious student. Yet the science of man is peculiarly attractive to human kind, and for this reason the untrained are constantly venturing upon its purlieus; and since each heedless adventurer leads a rabble of followers, it behooves those who have at heart the good of the science not only to guard carefully their own footsteps, but to bell the blind leaders of the blind. The blind leaders are sometimes comparatively innocent traffickers in the imaginary, like unto the **SELLERS OF POISON DRINKS**, and sometimes the less pardonable **DECEIVERS OF THE UNWARY** and **DEFEATERS OF JUSTICE**, like unto **COMMERCIAL SWINDLERS**; while the blind led are the dupes of the one and the victims of the other.

No question in anthropology is more enticing than that of human antiquity, and there is much writing on the subject—some good, more bad. In the latter class fall two recent publications, which have much in common. The first of these is Doughty's "Evidences of Man in the Drift;"¹ the second is Wright's "Man and the Glacial Period."² Both works profess to treat of the geologic antiquity of man, though neither author can be classed as geologist or anthropologist. The former is a numismatist, a member of the American Numismatic and Archæological Society, and makes no pretense of geologic skill or repute; the latter is a professor of theology in a theologic seminary, yet lays claim withal to geologic skill, (C) which serves to render his writing the more specious.

(Note C) The reviewer and Professor Wright are at entire antipodes as to the best way to acquire "geologic skill." Professor Wright has spent much time in the field studying nature, while Mr. McGee seems to think a man on a stool will know most about the field. Witness his "geomorphy" hereafter. Early in Mr. McGee's remarkable career as a geologist, in an address before the Iowa Horticultural Society, after discussing the glacial field in Illinois, Iowa and Missouri, he said: "It hence appears that in certain cases the geologist is able, after a few weeks' actual observation and some philosophic research, to so definitely formulate the character of

¹ Evidences of Man in the Drift—a description of certain archæological objects recently discovered in Massachusetts, Connecticut, New York, Pennsylvania and New Jersey: read before the American Numismatic and Archæological Society, March 28, 1892; by Francis Worcester Doughty. New York: privately printed, 1892.

² The International Scientific Series. Man and the Glacial Period; by G. Frederick Wright, D. D., LL. D., F. G. S. A., professor in Oberlin Theological Seminary, assistant on the United States Geological Survey, author of *The Ice Age in North America*, *Logic of Christian Evidences*, etc.; with an Appendix on Tertiary Man, by Prof. Henry W. Haynes (fully illustrated). New York: D. Appleton and Company, 1892.

II

Mr. Doughty (D) appears to have made a large collection of ice-wrought and water-worn pebbles and ferruginous nodules from the glacial drift, and to have found in their varied and curious forms suggestions of elaborate art. The ferruginous nodules are his most precious relics, abounding as they do in the fantastic forms of clay cemented by iron oxides. "To geologists these tablets are known as a variety of clay stones" (page 13); but to Mr. Doughty they are engraved tablets rich in records of the past. "They bear upon their flattened surfaces figures of human and animal forms, sometimes singly represented, but more frequently in groups," of which one "represents a man with Cacaussian features sitting in the presence of several highly-colored individuals, who approach him with bowed heads. In each instance, either the seated figure holds a staff bearing the head of a serpent, or the staff is held before or behind him by another. The seated figure almost always wears an elaborate feathered crown resembling that worn by the Palenque figures" (page 10). "Having no desire to theorize," Mr. Doughty merely suggests that the scene represents "the ruler of the

deposits extending over an area which could only be examined in detail by years of labor, that months of investigation may not reveal a single inaccuracy or disclose a single unlooked for phenomenon."

Mr. McGee has done with this notion as a former candidate for State Treasurer said he did with his early poverty—he has held his own remarkably well.

There are those, who, in the study of nature, believe in observation rather than imagination.

Indeed, is it better to teach nature or to be taught by it? What would Agassiz, the founder of glacial geology, have thought of the stool system?

His experience, by his neighbor and friend, Longfellow, reads :

"And Nature, the old nurse, took
The child upon her knee,
Saying, 'Here is a story book
Thy Father has written for thee.'

"And he wandered away and away,
With Nature, the dear old nurse,
Who sang to him night and day
The rhymes of the universe.

"'Come, wander with me,' she said,
'Into regions yet untrod,
And read what is still unread
In the manuscripts of God.'

"And whenever the way seemed long,
Or his heart began to fail,
She would sing a more wonderful song,
Or tell a more marvellous tale."

(Note D) No notes are made as to the pamphlet of Mr. Doughty, though there is no apparent reason why he should be so dishonored by personal abuse. His pamphlet has nothing in common with the book of Professor Wright and is evidently reviewed with the other to transfer ridicule and abuse from one to the other, if that may be accomplished.

serpent clan, or totem, receiving homage from * * * subordinate tribes." "Many of these clay tablets are painted, but the arrangement of color, which resembles the Chinese style, is such as to render it very difficult to determine the nature of the scenes depicted." They are also patinated. A perplexing feature, however, is "the want of proper division between the figures," which is ascribed to a fundamental idea of "space economy," and which "to our eye creates hopeless confusion. The large figures are made up of many smaller ones, and the designs are hard to decipher. * * * A foot in one group is liable to serve as a head in another, the arm of one becomes the leg of another," etc. Moreover, "a specimen held one way shows one design, reversed another, turned again, still another, and so on up to four." Most readers will heartily concur in the author's qualified opinion that "it is hard to understand such artistic methods" (page 11). The sculpturing is not external alone: "Many of the tablets contain a layer of clay through the center. * * * This interior layer of clay presents a second face as perfect as the first, and in every case is found worked up with figures or painted;" and "the most perfect depictions of the human form * * * were found upon the inside clay surfaces of some of these stones." Mr. Doughty's active imagination is able to find not only "traces of animal matter" in the tablets, but "parchment or skin dressed in clay;" and upon this scroll "appears an excellent male head, a full figure of a very fat gentleman, and other devices" (page 12). In short, "these tablets appear to be simply the clay books of the men of the drift;" and this interpretation is sustained by a quotation from Job, xix, 23 (page 13).

The pebbles are hardly less significant to Mr. Doughty; many are heads in profile and full face; some bear "Indian figures and feathered head-dresses strongly marked. Others represent faces of a distinctly Caucasian type, and are often heavily bearded. Sometimes the beard is represented as a mere goatee, at others as being blown by the wind, at others still cut square after the Assyrian style." "Other heads have been found of strongly-marked negroid features and cranial shape;" and it is truly remarkable that the Caucasian pebbles are white, the negroid pebbles black and the Indian pebbles brown, and even more remarkable that the Caucasian heads "wear hats of various recognized patterns" (page 9). Most striking of all is the solitary instance "of a white face with strongly-marked Celtic features, and a heavy red beard and moustache." The author suggestively adds, "I have found no representative of the cow, but of the man-headed bull I have several examples" (page 10). Other "existing animals" are "the dog, horse, sheep, rabbit, black bear, wolf, anthropoid ape, elephant, green adder, parrot and smaller birds, and the dolphin or whale." There are also many prehistoric animal forms, including "an animal of hippopotamus [sic] type, a large web-footed bird somewhat resembling the dodo, and, lastly, a reptile with a long snout and flattened paddle-like tail" (page 10).

Not content with proving the existence of man in the drift by these remarkable carvings, Mr. Doughty ventures to predict that the "Old Man of the Mountain, that gigantic human profile cut on the New Hamp-

shire hills" (an imaginative sketch of which embellishes the work), was carved out "untold ages ago by the men of the drift" (page 15).

It should be added that Mr. Doughty rejects the "well-known glacial theory" and accepts the view of Ignatius Donnelly, that "the drift was suddenly thrown upon the earth either by the contact of our planet with a comet or by some other agency not understood" (page 7).

In brief the book is a bundle of absurdities worthy of notice only because it is representative of the vain imaginings so prevalent among unscientific collectors and because its maleficent influence has been multiplied by favorable press notices.

III

The Reverend Professor Wright begins with an introductory chapter, in which he discusses the characters of existing glaciers. He says: "A *glacier* is a mass of ice so situated and of such a size as to have motion in itself. * * * Upon ascending a glacier far enough, one reaches a part corresponding to the lake out of which a river often flows. Technically this motionless part is called the *névé*. * * * The *névé* is the reservoir from which the glacier gets both its supply of ice and the impulse which gives it its first movement" (pages 2, 3). Unfortunately the author does not indicate how a moving body can have a motionless part, (E) nor how it receives both matter and motion from this motionless part. He fails, in short, to indicate what portion, if any, of his statement is true.¹

The second chapter treats of existing glaciers and the third of glacial motion, and in so far as they are made up of quotations from trustworthy observers are worthy of high confidence. It is to be regretted,

(Note E) This plain inaccuracy must have given Mr. McGee great joy, and fortunately it would mislead no one else. It was evidently not one of judgment. It may not have been the author's. If before the word "motionless" is inserted "nearly" or "apparently" or (if the author had in mind some former writers) "so-called," the grammar would be perfect. The meaning is clear. The *névé* is not absolutely motionless, but is described as a "lake out of which a river flows," which has some motion or it would never get to the outlet. See remarks of Mr. S. F. Emmons and Mr. W. H. Dall of the United States Geologic Survey, vol. vii, Bulletin of the Philosophical Society of Washington, p. 37 (meeting of May 10, 1884).

¹ Our foremost glacialist, Professor T. C. Chamberlin, says of this remarkable exposition: "As a matter of fact, the *névé* moves like other parts of a glacier, and the signs of such motion are indicated in the cut on the very page before the reader as he follows this astonishing statement. The motion of the *névé* has been a matter of common knowledge for half a century, and is absolutely beyond question. The comparison with a lake is wholly misleading, and evidently springs from a fundamental misconception of a glacier."—*The Dial*, vol. xiii, 1892, p. 303.

however, that the quotations are not more extensive (F) and in some cases better selected—for example, the observations of Sir Wyville Thompson in the antarctic region are ignored. It is to be regretted even more deeply that the author speciously defends his own blundering attempt to measure the rate of ice motion in Muir glacier instead of accepting the excellent series of measurements by Professor H. F. Reid. (G) In 1886 he sought to measure the movement of this magnificent glacier by “observations * * * with a sextant upon pinnacles of ice recognizable from a base-line established upon the shore” (page 47), and obtained a value of 70 feet per day. In 1890 Professor Reid measured the ice flow at the same season by theodolite readings on a line of flags at

(Note F) Mr. McGee differs from the *Edinburgh Review* for April, 1892, which, in an able article on Dr. Wright's larger work on the Ice Age, says, “From practical work he was led on to the eminently useful task of summarizing, for the benefit of the general reading public, the mass of information accumulated by himself and his coadjutors; and he brought to its execution the valuable qualifications of wide personal experience, quiet enthusiasm for his subject and a disinterested love of truth. He might, indeed, have trusted more than he has done to his own literary capabilities, for in his laudable desire to let his fellow laborers speak for themselves, he has unnecessarily, here and there, given to his admirably illustrated volume somewhat the air of a compilation.”

(Note G) It is the opinion of high authorities that both measurements were substantially correct. Mr. McGee is either very unfair or ignorant of the literature of the subject in all of which causes of difference appear. (See Man and the Glacial Period, p. 47; Am. Geologist, December, 1892, page 397; Mr. Warren Upham in “Pleistocene and Present Ice Sheets” at the Ottawa meeting of the Geological Society of America; Professor H. P. Cushing, Am. Geologist, October, 1891, pp. 215, 216; Scientific American for April 9, 1892, p. 227; and Professor H. F. Reid, vol. iv. Nat. Geog. Mag. pp. 41, 42.) Whether ignorant or not, Mr. McGee is certainly unfair, for Professor Wright on the very page referred to *did* accept Professor Reid's measurements. He even speaks of them as “by methods promising greater accuracy than could be obtained by mine.” Mr. McGee calls on Professor Wright to accept Professor Reid's measurements in place of his own when both Reid and Cushing say (did Mr. McGee read it?) that the ice must have moved faster in Wright's time. In 1890 it had retreated 3000 feet and was less than half as high. In 1886 it was apparently advancing, in 1890 retreating. Professor Reid anticipated it would continue to retreat; but Muir Glacier is a coquette, and, in 1892, Professor Reid found it was again advancing.

approximately equidistant points across the glacier, the observations being made from two stations on opposite sides of the stream. Two independent series of readings were made, each covering a period of three or four days ; and partly for the reason that they were designed to correct a manifest error, the observations were made with exceptional care. The measurements show that the daily motion ranges from a few inches near the sides to about 7 feet toward the center, the mean being 4 or 5 feet.¹ The reverend professor seeks to impugn this excellent work by specious arguments (page 47), and even FALSIFIES Reid's record by speaking of "ten feet per day in the most rapidly-moving portion observed," while Reid's highest figure is 7.2 feet. (H)

Chapter IV is devoted to "Signs of past glaciation." These signs are enumerated as (1) scratches upon the rocks; (2) extensive unstratified deposits; (3) transported boulders; and (4) extensive gravel terraces. The chapter is elementary if not puerile, and is characterized by EGREGIOUS AND MISLEADING EGOTISM. It purports to summarize the work of a large number of geologists in different countries, chiefly in the United States, yet but two American geologists are mentioned, while the first personal pronoun appears in a score of places, sometimes in deceptive connection. Thus he says (I) (page 62): "I have traced this limit of southern boulders for thousands of miles across the continent, according to the delineation which may be seen in the map in a later chapter ;" and again he extols "our map" and depreciates Professor Chamberlin's earlier mapping by comparison; (J) while in fact his map

(Note H) Professor Reid himself says, in Johns Hopkins University Circular, No. 84, "The observations on the flags showed a motion of eight to ten feet a day." In a paper in the *Literary Northwest*, for Feb. 1893, Mr. McGee wanders still farther from the facts, and, omitting even the 7.2 feet of his article, represents Professor Wright as representing that "Professor H. F. Reid's subsequent measurement of from four to five feet per day is worthless." This statement is in every respect the opposite of the truth.

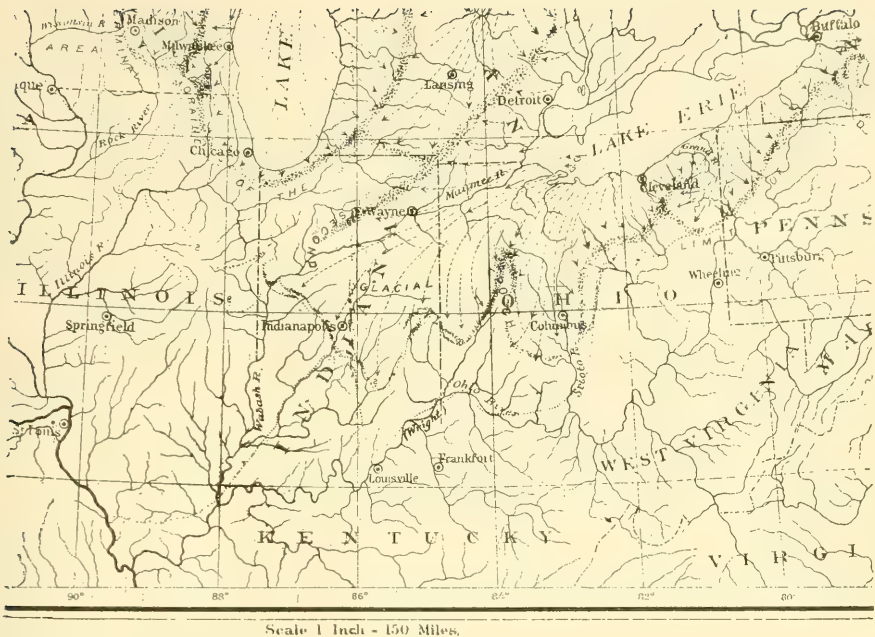
(Note I) This statement is strictly true. A thousand miles in East and West represents very many more miles of terminal moraine, as Mr. McGee ought to know, and could learn by looking at any map of it. The statement a few lines further on is not fair—Wright says, "thousands of miles across," not clear across. He has no doubt traveled that line for thousands of miles and no doubt a greater distance than any other man.

(Note J) This statement is entirely imaginative.

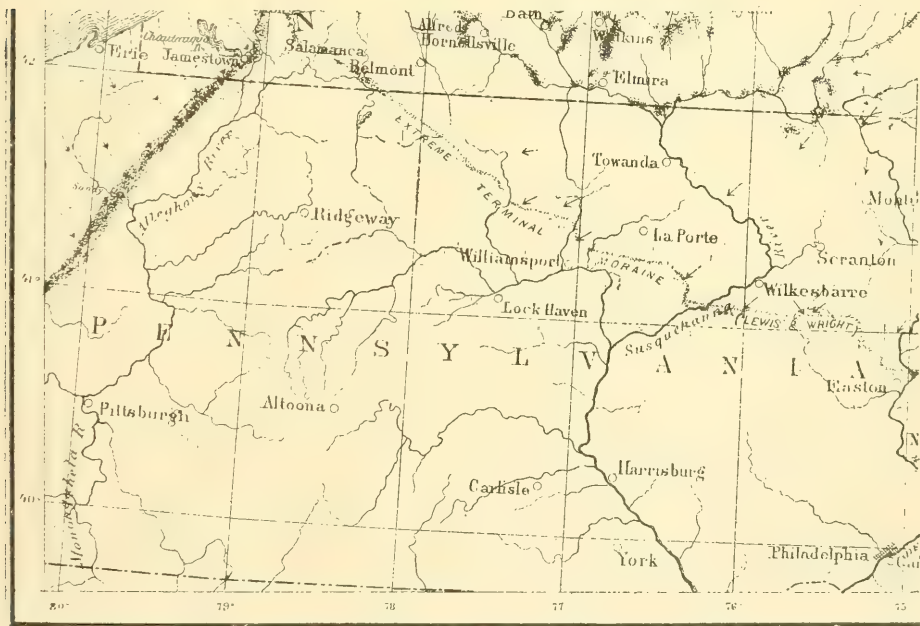
¹ Nat. Geog. Mag., vol. iv, 1892, page 44.

is little more than a reduction of a map published by Chamberlin years before, (K) and the Reverend Professor Wright never followed "across the continent" (I) any of the lines indicated upon it and never made any observations in the entire region which are accepted with confidence by leading American geologists. Moreover, the enumeration and descriptions of "signs of glaciation" is reprehensibly incomplete and archaic. Probably the most trustworthy and certainly the most widely-spread evidence of glacial action is found in topography. The American drift is known to be of glacial origin not only from its similarity to the moraines of living glaciers, but from a distinct surface configuration, entirely different from that produced by water or any other geologic agency except ice; and extensive drift-free areas are characterized by a topography which could not have been produced by running water, or by any other agency except moving ice. It is the function of geology to interpret these topographic

(Note K) This statement becomes very amusing upon an examination of the maps, for the very map which Professor Wright is said to have copied was itself copied from Wright. Not dishonorably so, for Professor Chamberlin expressly accredited to Professor Wright on the very face of his maps, the line from the Mississippi to Pennsylvania, and to Lewis & Wright the Pennsylvania line. (See Third Annual Report of Geol. Survey (map, page 314, map page 322, and map page 346); also Sixth Annual Report, map page 205, and Seventh Annual Report map, page 155.) Professor Chamberlin did not follow accurately the Wright line, but he partly corrects his line in the Seventh Annual Report, still giving Wright's name to the Ohio boundary and Lewis & Wright to the Pennsylvania. Copies of parts of the Chamberlin maps are herewith. The names are not very conspicuous in the original, but may easily be seen there and in this reproduction, by a glass. The name of Wright occurs just east of Cincinnati and Lewis & Wright in Eastern Pennsylvania. Professor Chamberlin, on pages 339, 341, 346 and 347 of the Report also refers to the work of Wright and of Lewis & Wright in tracing the boundary. Professor Wright not only credits "Professor Chamberlin" for his work—with not one uncomplimentary word—pages 101, 102 and 103, but praises his "sagacity," p. 102. The extent of the drift is partly shown on the Chamberlin maps by a drab wash, which does not appear in a photographic reproduction. In the *Literary Northwest* McGee mentions the above map on p. 314, 3d An. Rep., as the one claimed to be copied by Wright. He calls it "Chamberlin's classic map of terminal moraines, published early in the last decade." Well it may be classic, when it contains the lines personally surveyed by Professors Wright & Lewis. Every one of the five maps above mentioned contains credit to one or both. Why does not McGee use his glasses? It is not safe for him to browse around without them.



Part of the map of Professor T. C. Chamberlin, 3 An. Rept. of the U. S. Geol. Survey, page 314. The name Wright will be found above Frankfort close by the Ohio River.



Part of the map of Professor T. C. Chamberlin, 3 An. Rept. U. S. Geol. Survey, page 346. The names of Lewis & Wright will be seen just below Wilkesbarre.

forms through that branch of the science known as "geomorphy," or some times as the New Geology; and much of our knowledge concerning the glacial history of the continent has been acquired thereby; but there is nothing in the Reverend Professor Wright's numerous writings to indicate the slightest comprehension of the principles of geomorphy. (L)

In the fifth and sixth chapters "ancient glaciers" are described at dreary length; for the description is a mélange of crude observation, MISLEADING QUOTATION, and DECEPTIVE EGOTISM. Within a generation glacial geology has made great strides, and nowhere has the progress of the science been more rapid than in the United States. One of the results of the brilliant researches by Chamberlin, Winchell, Salisbury, Gilbert, Smock, Leverett, and other geologists is the recognition of a complex glacial history, including two, three, or more distinct ice invasions separated by intervals of mild climate; a history so complex and

(Note L) *Geomorphy*. Possibly Professor Wright, having much more experience in glacial phenomena than Mr. McGee, has not as much faith in McGee's new science as he himself has. At any rate it is hardly wise to reproach Professor Wright with not expounding it to the nation in so small a book as "Man and the Glacial Period," when McGee himself thinks it necessary to inform scientists of the *existence* of the science. See another tirade from McGee in *Science* for December, 1892, p. 317. He says: "Dr. Brinton errs in saying 'as a glacialist the author of this volume stands among the first in the country, and his long study of that remarkable period in the geologic history of the planet invests every thing he says about it with uncommon authority.' Within recent years there has grown up a new branch of geologic science which has been called by its devotees 'Geomorphic Geology,' 'Geomorphology' and still more acceptably 'Geomorphy,' and which is frequently spoken of as the 'New Geology.' It is the function of geomorphy to read geologic history from earth forms as the older geology read history from deposits and their fossils. * * * The primary idea has extended and expanded until now the geologist not only recognizes base levels in certain topographic forms but is able to determine from steepness of slope and other topographical relations the rate at which erosion has proceeded in the past and thereby the attitude and altitude of the land during earlier ages." As with most of McGee's big words these are not in the Century Dictionary, save geomorphy, there defined (I hope "acceptably") as "the theory of the figure of the earth." If Mr. McGee dabbles in the new geology, it is to be hoped he may "read geologic history from earth forms" more correctly than he has Professor Chamberlin's maps. It will, however, be difficult to determine the rate of erosion on hills containing in some cases all slopes, and in many cases different soils and rocks.

long-continued that, according to the independent estimates of different geologists, if the postglacial period is represented by unity, then the period which has elapsed since the beginning of glaciation must be represented by two figures. (M) But this conclusion of modern science is not recognized by the Reverend Professor Wright save when he seeks to conceal its evidence, and through a specious combination of quotation and suppression to misrepresent the views of competent geologists. (N) Thus his description is superficial and warped, and his conclusions are worthless or unintelligible. A generation ago the description and conclusions might have passed for science; to-day they rank as CHARLATANRY.

(Note M) What two figures, or is this *a* figure of speech? His Geomorphology should give more exact results. No one doubts changes in climate during the glacial period. Many, and indeed most geologists, doubt two entirely distinct glacial periods operating on the present surface of the Northern States. The author gives a full representation of these views, in fact fuller than he gives of his own (pages 322-326), including even the name of Mr. McGee. Possibly Mr. McGee did not read the book he abuses. From the fact that there early appeared lines of moraine far back of the front of the drift, some, too early, inferred that there were two entirely distinct glacial periods, being helped to that belief by a misunderstanding of British glacial geology, explained in this volume. A part of Professor Chamberlin's supposed moraine of the second glacial period will be seen on his maps herein, but every time the ice stopped it left a terminal moraine. Mr. Leverett has found eleven or twelve in Ohio. (See his article and map, *Am. Journal of Science* for April, 1892.) It is absurd to suppose each of these, marks a distinct glacial period, the ice from the extreme north gracefully again advancing as in a dance, and carefully stopping each time within a few miles of its former advance.

(Note N) It is interesting to compare Wright's clear statement of both sides, pages 106-120 and 322-326 with McGee's dogmatic statement in *Popular Science Monthly* for November, 1888, pp. 20-21. The *Popular Science Monthly* for April, 1893, p. 774, rightfully charges the reviewer with committing the very error he charges upon Professor Wright. The distinguished author says, "We cannot find in the volume any assertion that the ice age was a unit, though this is the view entertained by its author. On the contrary fourteen pages are filled with the arguments on both sides, enabling a reader to form his own opinion. It is fair to expect the critic to shun the fault he condemns." Page 326, in a note the author modestly says: "It does not yet seem to me that the duality of the period is proved."

The seventh chapter, "Drainage systems and the glacial period," is a systemless catalogue of a wide variety of interesting but distantly related facts. It is the function, and indeed the end, of science to classify phenomena in such manner as to indicate natural relation; but the arrangement in this chapter, if arrangement there be, is not such as to set forth natural relation, or geologic history, or science, but such as to conceal relation and give a false air of simplicity and unity to glacial history, and thus to contravene modern science. For example, the author refers to Winchell's work on the recession of the fall of St. Anthony at length (pages 209, 210), but in such manner as to suppress Professor Winchell's conclusions as to the bipartition of glacial history; (O) and on later pages (233-237) he quotes Russell and Gilbert on the fossil seas of the Great Basin in such manner as to convey an impression of fairness and completeness, yet in such terms as to conceal their conclusions concerning the bipartition of the lacustral history of this part of the continent. (P)

To the anthropologist the interest of the subject to which the work is nominally devoted centers in the eighth chapter, "Relics of man in the glacial period." The instances in which "the relics of man are directly and indubitably connected with deposits of this particular period east of the Rocky Mountains" (page 254) are (1) the Abbott argillites from the Trenton gravels; (2) the Metz "paleoliths" from Madisonville and Loveland, Ohio; (3) the Cresson "paleolith" from Medora, Indiana; (4) the Mills flint from Newcomerstown, Ohio; and (5) the Winchell-Babbitt quartz chips from Little Falls, Minnesota. In addition he introduces in evidence (6) the Cresson argillite from Claymont, Delaware; (7) the Calaveras skull and other relics from the Pacific coast, and (8) the Nampa figurine from Idaho, with the implication that the first of these indicates the existence of early glacial or preglacial man and the others preglacial or Tertiary man—the implication being deceptively guarded, however, by indefinite expressions and meaningless cross-references. (Q)

(Note O) As if the author ought to introduce under this head matter already fully discussed on pages 106-120.

(Note P) Express statement of this fact on page 237 "evidently there were two periods of marked increase in the size of the lakes, with an arid period intervening."

(Note Q) See Mr. McGee himself in the *Popular Science Monthly* for November, 1888, making pompous and dogmatic assertions in favor of the relics of glacial man in America. Pages 23, 24, he says: "It is significant that in all these cases the human relics were found in deposits representing the closing episodes of the later epoch of the Quaternary cold."

Now the first mentioned instance (the Abbott argillites) cannot be accepted by reason of the recent splendid work of Professor Holmes, who has shown, *first*, that the supposed paleoliths are not finished implements, but work-shop rejects or blanks; and, *second*, that there is grave reason for questioning whether the objects are not confined to the modern talus—*i. e.*, whether they occur in the Trenton gravels at all.

The second instance was formerly accepted by archeologists as evidence concerning the distribution of the hypothetic glacial man whose existence was supposed to be proved by the Trenton and Little Falls testimony; but since the occurrences are isolated, since the finder is not a skilled geologist able to discriminate between undisturbed glacial deposits and the talus derived therefrom, and since in one case similar objects occur on the surface above the point at which the "paleolith" was found, the presumption is against the evidence and the "finds" cannot be accepted as proof of the existence of man during the glacial period. The same must be said also of the third and fourth instances; and in connection with the last it is necessary to observe that the indirect personal statements of the Reverend Professor Wright (page 251) are unworthy of confidence partly because they are indirect, partly because his incompetence as a geologist is tested by another of his "instances" (the Nampa figurine).

The fifth instance (that of Little Falls) must be rejected because Professor Holmes, with Professor N. H. Winchell, who first found artificial flakes in the surface sands at this place, has within the year shown by means of excavations and extended surveys that there is no implement-bearing stratum at the locality in question, and that the quartz chips are confined to the talus and to the surface soil and subsoil within reach of the windfall excavations now pitting the surface of the glacial terrace. It is painful to learn that a conscientious observer like the late Miss Babbitt should be at fault in a matter of so grave import; enough to say that the original discoverer accepts Professor Holmes' conclusions.

"These cases," cited by him, include nine discoveries including N. H. Winchell's, Gilbert's and—bless my soul—one by *McGee himself*. He has on pages 28-36 a very precise description of the country where the New Jersey implements were deposited, with several maps and bird's-eye views, so precise that he could have gotten it only from his "*Geomorphy*," and on page 31 makes the astounding statement, "The implements occur in such numbers that over 25,000 have been collected by Abbott," which is 24,600 more paleoliths than Abbott ever claimed to have found. He says the "turtle back' type (of implement) is found throughout the deposit" (Trenton gravel) from top to bottom but most abundantly in the lower half and in progressively diminishing abundance from bottom to top of the upper half, while the 'leaf shaped' type is found only in the upper half and in progressively increasing abundance upward," etc. * * * "The implements of higher type occur over the surface of the Trenton gravels

The sixth instance (Cresson's Claymont argillite) must be rejected, *first*, on the ground of inherent improbability, because its acceptance would at once multiply human antiquity by 10, 20, or 50; *second*, because of the presumption that the object really occurred in the talus; ¹ and third, because of the utter lack of definitely corroborative testimony. It is to be observed that Professor Wright's personal plea concerning this instance is incompetent, irrelevant, and immaterial because his conception of glacial history is without time basis—he fails to recognize the succession of widely separated episodes of which the glacial period was made up. His expressions, too, are misleading; his declaration that “both Mr. McGee and myself have visited the locality with Dr. Cresson, and there can be no doubt that the implement occurred beneath the Columbia gravel” (pages 258, 259), conveys the idea that the three parties named concurred in the observation and the conclusion, while as a matter of fact no more than two of the trio were ever on the ground at the same time, only one made the original observation, and one at least emphatically repudiates the conclusion that the “implement,” if implement it be, occurred underneath the Columbia gravel. The distortion of fact in this declaration smacks of the SHYSTER. (R)

The seventh instance cannot be accepted by any cautious archeologist at the apparent value assigned by the reverend professor. There is, indeed, a large body of testimony concerning the association of human relics in auriferous gravels beneath broad lava sheets on the Pacific coast, but the gravels and lava sheets have not been correlated with the glacial deposits of eastern United States or Europe, and their antiquity, either in years or in terms of geologic chronology, has not been determined.

The eighth instance (the Nampa figurine) is the most satisfactory of all, since it affords a measure of the competence on the Reverend Professor Wright as a geologist and as a reasoner of the important subject of the antiquity of man. It is alleged that in 1889 the figure, a brittle, baked-clay image as fragile as a clay pipe-stem, was brought up in the

but never within them, while the ruder implements found within the gravels do not occur upon the gravel surface.” That article is worth reading by anyone interested in this review.

(Note R) Professor Wright does not say he visited the spot with McGee, but with Cresson. Professor Wright is a high-minded, candid Christian gentleman and McGee would be fortunate to have him for a companion. Is it not funny that McGee's abuse should have accompanied this statement in Professor Wright's book, p. 258, “As there is so much chance for error of

¹ The presumption implicitly accepted by Mr. Cresson in a recent publication—*Science*, vol. xx, 1892, page 304.

sand pump used in connection with a heavy drill (S) in boring an artesian well at Nampa, Idaho, from a depth of 320 feet and beneath a heavy lava sheet. Now, it is a fact that one of the best-known geologists (T) of the world chanced to visit Nampa while the boring was in prog-

judgment respecting the undisturbed condition of the strata, and as there was so little opportunity for Dr. Cresson to verify his conclusion, we may well wait for the cumulative support of other discoveries before building a theory upon it"?

(Note S) Mr. McGee introduces the phrase "in connection with a heavy drill" in such manner as to lead the reader to think that Professor Wright makes such a statement. Professor Wright says on page 297 (Man and Glacial Period) "the strata passed through included, near the surface, fifteen feet of lava. Underneath this, alternating beds of clay and quicksand occurred to a depth of 320 feet, where there appeared indications of a former surface soil lying just above the bed rock from which the clay image was brought up in the sand pump." A heavy drill was used in the lava but not below. Does Mr. McGee think that the heavy drill in the lava would destroy the image 250 feet below, or does he actually suppose that a heavy drill is used in pumping quicksand? In the article in the *Literary Northwest*, p. 275, Mr. McGee, with still greater disregard for facts, says, "alleged to have been pounded out of volcanic tuff by a heavy drill."

The great antiquity given by McGee to the relics beneath the lava is not Wright's mistake, but McGee's in making the lava flow too old.

(Note T) Was this "best known geologist of the world" Mr. McGee himself, and did he fail to give the name through modesty? Impossible. Mr. Kurtz, a gentleman of high reputation and well known by leading and prominent men in Idaho and elsewhere, indignantly denies such statement to *anyone*. The Nampa image was prominently introduced before the world by Mr. Charles Francis Adams in 1889, and made the subject of a careful meeting of the Boston Society of Natural History, January 1, 1890, Professor Putnam presiding, and participated in by Professors Morse, Scudder and Haynes with a long letter from Mr. Emmons, of the United States Geological Survey (Proceedings Boston Society of Natural History, vol. xxiv, 1889, pp. 424, 450). It was prominently presented, with illustration, in the New York *Independent* and the *Scientific American*, in November, 1889. The Associated Press carried it throughout the country.

ress, and the figurine and the pretty fiction were laid before him. He recognized the figurine as a toy such as the neighboring Indians give their children, and laughed at the story; whereupon the owner of the object enjoined secrecy, pleading "Don't give me away; I've fooled a lot of fellows already, and I'd like to fool some more." The geologist in question gave no further thought to the matter, knowing that so transparent a fraud would never deceive even a tyro in geologic science; but when it came to the notice of the Reverend Professor Wright he accepted the fiction and far outstripped the jocular finder by foisting it in the public print as evidence of great human antiquity. It may be added that while the figurine has attracted much attention among archeologists, several (including Professor Holmes) refused to accept it even as prehistoric because of the suggestion of classic models found in its lineaments.

In short, chapter VIII is a tissue of error and MISREPRESENTATION; not one of the "indubitable" instances is worthy of credence; and its publication to the world as an exposition of American science is an OFFENSE TO THE NOSTRILS.

Two chapters follow on "The cause of the glacial period" and "The date of the glacial period;" it is enough to say that they are of a piece with the earlier chapters.

The work ends with an appendix on "Tertiary man," by Professor Henry W. Haynes, which, albeit short and from the geologic standpoint superficial, is a silver lining to the cloud.

In brief, the introductory chapter of "Man and the glacial period" is absurdly fallacious; the chapter on existing glaciers is redeemed by quotations, but the chapter on "glacial motion" is DAMNED by error and SPECIOUS MISREPRESENTATION; the chapter on "past glaciation" is crude, unjust, egotistic and a generation behind modern science; the fifth, sixth and seventh chapters contain a large body of information which would be useful if properly arranged, but the arrangement is unscientific, unfair to American geologists, and misleading to readers; the eighth chapter purports to prove that man existed during the glacial period, but the evidence is inconclusive, and only proves, *first*, that the author is incompetent to deal with geologic phenomena, and, *second*, that his conception of geologic history is feeble and hazy; while of the concluding chapters it must be said, tritely yet truly, that nothing that is true is new, and nothing that is new is true.

It would be charitable to allow the arraignment of the work to end here with the implication that the author in his ready acceptance of

The *Nation* had an article; accounts were extensively published in *Scribner's Magazine* for Feb. 1890, in the *Atlantic Monthly* for April, 1891, and in other prominent papers. It seems improbable that this best known geologist, if connected with the United States Survey, in *public pay*, at a *knave's* request, permitted such a *public fraud openly confessed*, if indeed, this "is a fact" and not another mistake of Mr. McGee's.

untrustworthy evidence and his apparent distortion of the view of geologists is a simple enthusiast, A GULL rather than a VULTURE; but it is due to scientific truth to point out EVIDENTLY INTENTIONAL DECEPTION on the title page. The imposing list of titles which the author appends to his name conveys the impression that he is a geologist rather than a theologian, which is misleading; that he is a professor of geology, (U) which is not true; and that he is an "assistant on the United States Geological Survey," which is SHEER MENDACITY and THEFT OF REPUTATION. (V) The character of the book is indicated by the many errors and misstatements; the character of the author must be gathered from the inherent evidence of his incompetence, the scores of misleading statements, and the apparently DELIBERATE FALSIFICATION of facts on his title page.

IV.

The two treatises have much in common; both represent the work of the HARPIES by which the work-shops and market-places of science are haunted, both are misleading and pernicious, and both handicap science and hinder the progress of knowledge. Yet there are differences between them: Doughty's work is confessedly extra-scientific, or infra-scientific, and hence will receive little attention outside of the few ill-trained collectors of fantastic objects into whose hands it may fall; while Wright's work represents a stage of science, albeit a primitive stage, and will thus find more frequent readers and work the greater injury. Again, Doughty's pamphlet is privately printed and thus bears the impress of Gilead, while Wright's book is issued by a reputable house as one of an international scientific series, whereby its maleficence is multiplied. Furthermore, Doughty's conclusions are disproved by their absurdity; but some of Wright's conclusions are not *a priori* absurd, and their falsity can only be shown by geologists and anthropologists, whom it behooves to caution laymen and learners against the man and the book. Doughty is a simple-hearted quack whose bread-pills but tickle the fancy of weakling dupes; Wright is a BETINSELED CHARLATAN whose POTIONS ARE POISON. Would that science might be well rid of such HARPIES, especially the latter!

(Note U) Mr. McGee mislaid his glasses again. The title page reads: "Professor in Oberlin Theological Seminary," not *Geological* Seminary.

(Note V) Large words again. The preface is dated May 1, 1892. The book was fully printed in June. Professor Wright's official connection with the United States was ended by the following letter:

"General Record United States Geological Survey, Office of the Director, No. 1379, July 11, 1892.

WASHINGTON, July 8, 1892.

MR. GEORGE F. WRIGHT, Present:

"SIR—On the recommendation of the Director your services as an Assistant Geologist @ \$5.00 per diem in the Geological Survey Temporary Force are hereby dispensed with from and after July 8, 1892.

Respectfully,

JOHN W. NOBLE, Secretary.

Through the Director of Geological Survey."

CONCLUSION.

Mr. McGee's last comparison of Professor Wright to the harpies brings Virgil's *Æneid* to mind. The eleventh line ends—

"Tantaene animis coelestibus irae?"

"Can heavenly natures nourish hate
So fierce, so blindly passionate?"

In Juno's case, however, jealousy was the cause of anger.

Yet one cannot help surprise at such an article.

Why did Mr. McGee write it?

He has published such articles in several papers or magazines. Why?

One in the *Literary Northwest*, for February, 1893, is even more inaccurate than the foregoing, if possible more abusive—adding to his name, to add to the abuse, the title "U. S. Geological Survey."

The title of the article is "A Geologic Palimpsest." Not seeing at once how the last word applied, I referred to the "Century" and found the first meaning to be a "manuscript written upon another." But this is a printed review upon a printed book. A second meaning is "a monumental brass," and I must say the title fits the paper.

I am the more inclined to believe in this satire of Mr. McGee upon himself, because in the same article in the *Literary Northwest*, he made his finest exhibition of wit.

It may be remembered that in the article here reprinted he gave Professor Wright a "Doughty" companion, intended apparently to help McGee's abuse.

In the *Literary Northwest*, in similar manner, he gave, as a comrade, the "late" Capt. Willard Glazier, who claimed to have discovered the source

of the Mississippi. McGee calls him "Brazier" a stroke of wit in which McGee felt such pride as to repeat it eight times. That it was pure wit, and not accident, appears by the context, including the correct name.

Who is Mr. McGee?

How did he come to be in a leading position on the U. S. Survey?

Making such inexcusable blunders and with such an enormous personal equation, is he the best man to fill up the reports of the geological survey?

Is it any part of his business to use the weight of his position—in the service and pay of this great nation—in branding high minded, learned, and eminent Christian gentlemen as thieves, robbers, poisoners, commercial swindlers, falsifiers, shysters, betinseled charlatans and harpies?

When Professor Wright had given years to glacial geology and was becoming eminent as a gentleman of modest and accurate learning, Mr. McGee was a land surveyor.

How did he get into the U. S. Geological Survey? Was it a clerical blunder taking him to the wrong survey? If he was in the land office in a subordinate position with some fat man over him who could sit on him occasionally (or perhaps often), he might be useful and possibly vastly safer and cheaper to the American people.

C. C. BALDWIN.



